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General Notes.

PETROGRAPHY.[1]

The Eruptives of Missouri.—Haworth[2] has described in much detail the dykes and acid eruptives in the Pilot Knob region, Missouri. The dyke rocks are typical diabases, diabase-porphyrites, quartz-diabase-

[1] Edited by Dr. W. S. Bayley, Colby University, Waterville, Me.

[2] Mo. Geol. Survey, Vol. VIII, 1895, p. 83-222.

porphyrites and melaphyres. The author unfortunately classes as diabase-porphyrites both glassy and holocrystalline rocks. The acid rocks of the region include granites, granite-porphyries, porphyrites and quartz-porphyries. The first two are characteristically granophyric. Their orthoclases are often enlarged by granophyre material whose feldspar is fresh, while the nucleal feldspar is much altered. The quartzes likewise, are enlarged by the addition of quartz around them. There were two periods of crystallization in these rocks. In the second period the phenocrysts were corroded and the groundmass was produced. In addition to the quartz and orthoclase there are present in these rocks also biotite, hornblende, plagioclase and a number of accessory and secondary components. The porphyries and porphyrites contain the same constituents as the granites, from which they are separated simply on account of differences in structure. The phenocrysts are mainly orthoclose, plagioclase, microcline and quartz, many of which are fractured in consequence of magma motions. The groundmass in which these lie is of the usual components of porphyry groundmasses, and in texture is microgranitic, granophyric, micropegmatitic and spherulitic. Many of the porphyries contain fragments of their material surrounded by a matrix of the same composition in which flowage lines are well exhibited. These rocks are evidently volcanic breccias. The author divides the porphyritic rocks into porphyries and porphyrites, the latter containing plagioclase phenocrysts and the former phenocrysts of quartz, orthoclase and microcline.

Rocks from Eastern Africa.—The volcanic rocks of Shoa and the neighborhood of the Gulf of Aden in Eastern Africa comprise a number of varieties that have been carefully studied by Tenne.[3] The main mass of the mountains of the region consists of biotite-muscovite gneiss. This is cut by nepheline basanites, the freshest specimens of which contain phenocrysts of olivine, augite and feldspar in a groundmass of plagioclase, augite, nepheline and often olivine. Trachytes, phonolites and basalts occur in the Peninsula of Aden. The trachytes include fragments of augite-andesite. Inland granophyres with pseudospherulites in their groundmass, trachytes and feldspathic basalts were met with. The granophyres are much altered. In the fine grained product formed by the decomposition of the groundmass of one occurrence quartz, feldspar, and a blue hornblende with the properties of glaucophane can be detected. All the rocks are briefly described. They present no peculiar features other than those indicated.

[3] Zeits. d. deutsch. geol. Ges., XLV, p. 451.

A Basic Rock derived from Granite.—Associated with the ores in the hematite mines of Jefferson and St. Lawrence Counties, N. Y., is a dark eruptive rock that was called serpentine by Emmons. Smyth[4] (C. H.) has examined it microscopically and has discovered that it consists of a chlorite-like mineral, fragments of quartz and feldspar. By searching carefully he discovered less altered phases of the rock that were identified as granite. The peculiar alteration of an acid granite to a basic chlorite rock is ascribed to chemical agencies. According to the author's notion the pyrite in a neighboring highly pyritiferous gneiss was decomposed, yielding iron sulphates and sulphuric acid. These solutions passed into limestone yielding the ores and then into the granite changing it into chlorite. The altered rock is found only with the ores. The original was probably not always granite. An analysis of the altered rock gave:

SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O	Total
29.70	17.03		27.15	10.66	1.68	.56	.10	11.79	= 98.67

Cancrinite-Syenite from Finland.—In the southeastern portion of the Parish Kuolajaroe in Finland, Ramsay and Nyholm[5] secured specimens of a nepheline-syenite containing a large quantity of what the authors regard as original cancrinite. The rock is found associated with gneissoid granite at Pyhakurn. The rock is trachytic in structure and is composed of orthoclase, aegerine, cancrinite and nepheline as essential constituents and apatite, sphene and pyrite as accessories. The cancrinite was the last mineral to crystallize. It occupies the spaces between the other components, and yet it often possesses well defined hexagonal forms. It occurs also as little prisms included within the orthoclase. Because of this association and because the nepheline in the rock is perfectly fresh the cancrinite is regarded as original. This mineral comprises 29.04% of the entire rock.

The same authors in the same paper describe a porphyritic melilite rock found as a loose block a few kilometers W. N.-W. of Lake Wuorijarvi. It contains large porphyritic crystals of melilite, pyroxene and biotite in a groundmass composed of labradorite, zeolites and calcite. The pyroxenes are made up of a colorless augite nucleus surrounded by zones of light green aegerine-augite and deep green aegerine. No olivine was detected in any of the thin sections.

[4] Jour. Geology, Vol. 2, p. 667.

[5] Bull. Com. Geol. d. l. Finn., No. 1.

Rocks from the Sweet Grass Hills, Montana.—Weed and Pirsson[6] describe the rocks of the Sweet Grass Hills of Montana as quartz-diorite-porphyrites, quartz-syenite-porphyries and minettes. The first named rock presents no special peculiarities. The quartz-syenite-porphyry contains orthoclase, plagioclase and augite-phenocrysts in a fine groundmass of allotriomorphic feldspar and quartz. The augite is in short thick prisms composed of a pale green diopside core, which passes into a bright green aegerite mantle. The minette also contains aegerine, but otherwise it is typical.

Petrographical News.—Two peculiar phonolitic rocks are described by Pirsson[7] from near Fort Claggett, Montana. One is a leucite-sodalite-tinguaite, with leucite pseudomorphs, and sodalite as phenocrysts in a groundmass composed mainly of a felt of orthoclase and aegerine. The leucite pseudomorphs are now an aggregate of orthoclase and nepheline. In the centers of some of them are small stout prisms of an unknown brown mineral, that is pleochroic in brownish and yellowish tints. The second rock is a quartz-tinguaite porphyry somewhat similar to Brögger's grorudite.[8]

In a few notes on the surface lava flows associated with the Unkar beds of the Grand Cañon series in the Cañon of the Colorado, Ariz., Iddings[9] briefly describes compact and amygdaloidal basalts and fresh looking dolerites that are identical in all respects with modern rocks of the same character.

Laspeyres[10] estimates that the quantity of carbon-dioxide in liquid and gaseous form contained in rocks is sufficient to serve as the source for all that which escapes from the earth's natural fissures as gas, as well as that which escapes in solution with spring water. It may be set loose from the rocks through the action of heat or through the action of dynamic forces.

In a handsomely illustrated brochure Merrill[11] describes the characteristics of the onyx marbles and the processes by which they originate. Differences in temperature, according to the author, are not the controlling conditions determining the differences in texture between the onyxes and travertine. He is inclined to the belief that the banded onyxes were formed by deposition from warm solutions under pressure flowing into pools of quiet cold water.

[6] Amer. Jour. Sci., Vol. I, p. 309.
[7] Amer. Journ. Sci., 1895, Nov. p. 394.
[8] AMERICAN NATURALIST, 1895, p. 567.
[9] 14th Ann. Rep. U. S. Geol. Survey, p. 520.
[10] Korrespond. bl. Naturh. Ver. preuss. Rheinl., No. 2, 1894, p. 17.
[11] Rep. U. S. Nat. Mus., 1893, p, 539.

In a preliminary report on the Geology of Essex County, N. Y., Kemp[12] describes the occurrences of the gneisses, limestones, ophicalcites, gabbros, lamprophyres and other igneous rocks of the district, and gives an account of their geological relationships.

GEOLOGY AND PALEONTOLOGY.

Bear River Formation.—The explorations of Mr. Stanton and Mr. Charles White in the Bear River Valley have been the means of correcting a long standing error among geologists concerning the taxonomic position of strata known as the Bear River Formation. A summary of the facts as presented by Mr. White in a late Bulletin of the U. S. Geol. Survey shows that the formation under discussion is not Laramie, to which age it has been hitherto been referred, but belongs to the Upper Cretaceous, at or near the base of that series. That is its position has been determined by Mr. Stanton as beneath the Colorado formation, and above that series of Jurassic strata which occurs within a large part of the interior region of North America generally regarded as of Upper Jurassic age and which in the general section given is called "Dakota?" This accords with the reputed age of a formation in Hungary, whose fauna is more nearly like that of the Bear River series of strata than of any other known.

Mr. White, therefore, defines the Bear River series as a distinct formation stratigraphically, geographically, and paleontologically, and states in detail its taxonomic position. All the known fossils of the formation are described and figured, comparisons are made of its fauna with those of other nonmarine formations of this and other continents, and relevant biological questions are discussed.

In making a general comparison of the Bear River fauna with the other nonmarine fossil faunas of North America, Dr. White calls attention to those features of the Bear Fauna by which it differs conspicuously from all the others. Reference is here especially made to the Auriculidæ and Melaniidæ, because it is members of these two families that give the Bear River Fauna its most distinctive character. In this connection the author remarks "this faunal character is all the more conspicuous because, of the six genera which represent those two families, only two of them are known in any other North American fauna, either fossil or recent."

[12] Report of State Geologist [of New York] for 1893, p. 433.